THE

AGRICULTURAL BULLETIN

OF THE

FEDERATED MALAY STATES.

No. 7.] FEBRUARY, 1914. [Vol. II.

PARASITIC FLOWERING PLANTS ON RUBBER TREES.

By F. T. Brooks.

During a recent visit to an estate in Negri Sembilan it was noticed that a considerable number of old Para rubber trees were attacked by two kinds of parasitic flowering plants in a manner similar to that in which mistletoe attacks certain trees in Europe. These flowering plants possess green leaves but weaken the host by obtaining supplies of water and mineral salts from the branches to which they are attached by means of suckers. Several of the rubber trees carried many of these parasitic growths which were evidently doing considerable damage, the portions of the branches beyond the place of attachment of the parasite being killed in a number of cases.

The area which was most severely affected by these parasitic flowering plants consisted almost entirely of trees in poor condition. They had probably been over tapped some years ago and were badly burred. The foliage was thin and it was probably this circumstances which enabled these parasites to become established, for in a tree possessing a healthy and vigorous leaf canopy the light below the crown of the tree would probably be sufficiently reduced to prevent the development of these troublesome plants.

All branches bearing such growths should be cut out and efforts should be made by manuring to stimulate a more vigorous development of the rubber trees. The trees should be rested until a better leaf canopy has developed.

The two species of flowering plant which are causing this trouble have not yet been indentified but it is hoped to do this shortly; meanwhile a more detailed investigation is proceeding.

Both of the parasites concerned have simple, entire leaves which are quite different from those of *Hevea brasiliensis;* the leaves of one of the parasites are long and narrow, about 2″ by ½″, the leaves of the other are about 3″ by 2″.

Both parasites spread along the branches of the rubber trees by means of creeping stems which drive suckers into the host at intervals. Owing to their distinctness the presence of these parasites on rubber trees can be easily determined.

MINUTES OF MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Held at the Lower Perak Club, Telok Anson, on January 11th 1914, at 10.30 a.m.

PRESENT.

Mr. R. W. Munro, Chairman.
Mr. H. C. E. Zacharias, Secretary.
and the following delegates:—

From Negri Sembilan P. A.	.. ..	Mr. E. A. Tayler.
„ „ „ „	.. ..	„ S. S. Crisp.
„ „ „ „	.. ..	„ C. Ritchie.
„ Batu Tiga D. P. A.	.. ..	„ G. H. Bennett.
„ „ „	.. ..	„ T. J. Cumming.
„ Central Perak P. A.	.. ..	„ A. B. Milne.
„ Johore P. A.	.. .. ..	„ J. Bruce.
„ Kuala Lumpur D. P. A.	..	„ F. C. Jeavons.
„ Ulu Selangor D. P. A.	..	„ W. de L. Brooke.
„ Kuala Langat D. P. A.	..	„ H. L. Carter.
„ Taiping D. P. A.	.. ..	„ H. de Z. Lancaster.
„ Batang Padang D. P. A.	..	„ E. Dane.
„ „ „ „	..	„ C. Darby.
„ Lower Perak P. A.	.. ..	„ M. Maude.
„ „ „ „	.. ..	„ W. Dell.
„ Bagan Datoh P. A.	.. ..	„ J. M. Counsel..
„ „ „ „	.. ..	„ R. H. W. Davidson.

Honorary Member: The Dir. of Agriculture (Mr. L. Lewton-Brain).

Visitors: Messrs. F. G. Spring, L. C. Brown, J. C. Osborne, E. E. Lawford, F. T. Millard, L. Hopkins, C. Peters, G. T. Lachlan, G. Wiseman, R. G. Bayley, W. D. Tait, H. Money, T. A. Manchip, T. L. Stevens, B. H. Levi, H. J. Cooper, W. Plummer, P. A. Tyler, E. J. Koch, B. Bunting, G. G. Jeavons, B. Johnson, A. W. Wilson, L. R. Harley and J. Cruickshank.

---

1. The Minutes of the Meeting held on October 5th are taken as read, confirmed, subject to the substitution on page 27, line 8, of the word "might" for "would."

2. London 1914 Exhibition.

The Secretary reports having received to date promises from 77 Companies, aggregating $9766.11; and reads correspondence, between himself, the Under-Secretary, F. M. S., and the Rubber Growers' Association.

The *Director of Agriculture* reports progress made and at the request of the meeting undertakes the collection of exhibits &c., as was done in the case of the New York Exhibition.

3. Batavia Congress.

The Secretary places on the table a guide book to the Exhibition, published by the Organizing Committee, and reads the following letter:—

"Permatang Estate,
Banting,
Selangor, F. M. S."

"W. E. Van Rynberk, Esq.,
Secretary to the Sub-Committee,
Batavia Congress and Exhibition,
SINGAPORE."

"Dear Sir,

I am duly in receipt of your letter of September 29th for which I thank you.

At a meeting of the Planters' Association of Malaya held on the 5th instant in Kuala Lumpur, I took the opportunity of conveying to the members present the salient points of your letter, and it was the general feeling of the meeting that support of some kind or other should be given by the planting community in the way of an Exhibit, having in mind specially the fact that the Executive Committee at Batavia had expressed its willingness to assist in the question of finance should it be considered necessary to ask for any assistance of this sort. On behalf of the members of our Association I shall be glad if you will convey in suitable terms our appreciation of this offer.

The meeting quite agreed that the question is one affecting the whole of the Eastern rubber producing community, and now that we are face to face with so serious a fall in the price of the raw material the time is an opportune one for endeavouring to bring about special combination, and co-operation.

It was decided at the above meeting that a Committee be formed consisting of Mr. Lewton-Brain, Mr. E. B. Skinner and myself to go into the whole question with a view to adopting a scheme somewhat on the lines suggested in your letter,

As regards representation at the Congress and Exhibition it has been decided that the Director of Agriculture, Mr. Eaton, and one other Government Official be asked to attend. Three unofficials will also be asked to join the commission, though it is not possible to say at present who will be in a position to take the necessary leave at the time.

I am, etc.,
(Sgd.) R. W. Munro."

Mr. Munro appeals to estates to send exhibits, as the cost would be infinitesimal, and hopes that a great number of planters will visit the Congress. Special arrangements had been made and the trip could be done in ten days, which would allow six at the Congress.

Mr. Counsel proposes that a cup for rubber to be called the P. A. M. Cup, be awarded at the forthcoming Batavia Exhibition in such section as the Standing Committee of the P. A. M. shall decide.

Mr. Milne seconds the proposal which is carried.

Mr. Counsel further proposes that the value of this cup do not exceed £50 and that its cost be met from the recently started Exhibition Fund.

Mr. Jeavons seconds this proposal which is likewise carried.

---

4. Repression of Drunkenness.

The Secretary reads correspondence dealing with this subject.

Mr. Ritchie believes a partial solution had been discovered in Negri Sembilan, where by a special arrangement with the Licensing Boards, estate Managers instead of boutique-keepers were now licensed; and reports that the system so far was working very well.

Mr. Dane is sure beer shops did as much harm as toddy shops.

Mr. Tayler agrees and fails to see any reason why the sale of beer should be free of any restriction.

Mr. Milne does not think Mr. Kellie Smith's figures at all exaggerated. He had often been along that road, and there were "literally hundreds" of drunken coolies rolling about, on any night. The sale of these horrible and poisonous mixtures ought certainly to be stopped, by means of putting shops under more efficient control and paying surprise visits, etc.

Mr. Jeavons says that near his estate there were no less than twelve small shops and of these ten sold beer, without, so far as he could see, any supervision. There has been an enormous amount of trouble lately, and he put it down to this beer, which presumably was adulterated.

Mr. Bennett believed there was a very useful beer coming out for the use of the coolie, called the "Revolver" brand. A coolie who had a dose of that and then some toddy was pretty well finished off.

Mr. Maude is of opinion that beer whether adulterated or not is intoxicating and bad for the coolie. He would therefore propose that beer be included in the definition of "Spirituous Liquors" in the Excise Enactments 1908/9 and that the Government be written to accordingly.

This is seconded by *Mr. Jeavons* and carried unanimosuly.

5. Education on Estates.

The *Secretary* reports having obtained details of the system of education on Ceylon estates and that this includes the opening of estate schools in the afternoon.

He also reads the following correspondence, which is received by the meeting with applause:—

"Kuala Lumpur, 10th October, 1913."

"Controller of Labour, F. M. S.,
Kuala Lumpur."

"Sir,

I have the honour to acknowledge receipt of your letter 5/492 of August 30th re Education on Estates.

This matter was fully discussed at a Meeting of this Association held on the 5th inst., when it was resolved "that the Director of Education be asked to allow education on estates to continue for one year on the lines laid down in the Report of the P. A. M. Sub-Committee under date Oct. 21st 1912; that an examination be held towards the end of 1914 and that, where the results are satisfactory, the customary grants-in-aid be paid."

At the same time I was instructed to forward this Resolution to you and to invite your good offices in the matter."

"I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary."

"Kuala Lumpur,
Federated Malay States."
"6th December, 1913."

"Sir,

With further reference to your letter of July 10th, 1913, on the subject of the hours of attendance at schools for the children of Tamil labourers on Estates, I am directed to inform you that the Director of Education is being informed that as an experiment such schools should be opened for two hours only in the afternoon,

2. After this system has been given a year's trial the Director of Education will be invited to report as to the success or failure of the system."

"I have, etc.,
(Sgd.) W. Mackray,
for Ag. Under Secretary, F. M. S."

"The Chairman,
Planters' Association of Malaya,
Kuala Lumpur."

---

6. Rural Boards.

The Secretary reads the following letter and report from the Hon'ble Mr. E. B. Skinner, which is adopted unanimously:

"Kuala Lumpur,
25, XI. 13."

"The Secretary,
The Planters' Association of Malaya."

"Dear Sir,

I beg to enclose you herewith a copy of the report of the Sub-Committee appointed to meet the Controller of Labour, with a view to deciding on what points in the Labour Code the Controller of Labour should consult with the Sub-Committees of the District Planters' Associations, before taking action.

The matter was fully gone into by Mr. Macfadyen and myself, with the Controller of Labour, before Mr. Macfadyen went home on leave. It was intended that Mr. Macfadyen should make a report on the results of our consultations, but owing to his early departure for Europe, he was so busy that he apparently had not sufficient time to make up the report. I have therefore drawn it up as requested by you and submitted it to the Controller of Labour, who has approved of the report. I now send you a copy, for the information of your Association."

"I am, etc.,
(Sgd.) E. B. Skinner."

"Report of a Sub-Committee Appointed to Meet the Controller of Labour, with a View to Deciding on what Points in the Labour Code the Controller of Labour should, in Practice, Consult with the Sub-Committees of the District Planters' Associations, Before Taking Action."

"The question was discussed with the Controller, at considerable length, by the Sub-Committee (Messrs. Macfadyen and Skinner), and it was decided that the principal points on which

friction might occur between the Labour Department and the planting community were the issuing of orders for making wells, brick drains, particular kinds of lines, etc. It was also found that Part VIII of the Code practically covered all contentious points which were likely to arise, so it was decided that for the time being, the following procedure should be adopted:—

1. PLANS. Plans of lines under Section 192 (ii) should be sent in the first instance to the Controller of Labour for approval as hitherto and if approved without amendment or with such amendments as might be agreed to by the employer, no reference to the Sub-Committee of the local District Planters' Association would be required. If however, the Controller found himself unable to assent to plans in the form finally submitted for approval, he was not to reject them definitely without reference to the said Sub-Committee.

2. ORDERS. The procedure to be followed is defined as follows:—

Before making an order under Part VIII of the Code involving the expenditure of money, the Controller will notify the employer or manager of his intention to do so, at the same time expressly giving him an opportunity of objecting to the order being made. If no objection is made within a fortnight, the order may be made and enforced, if necessary, by the Controller. In every case it must be made clear to the employer or Manager that he has a fortnight in which to lodge an objection, if there be any.

If however, an objection is received within a fortnight, the Controller will refer the matter for the consideration of the local Sub-Committee.

The above procedure is not at present to be applied to cases of emergency, but such cases will be reported at once to the Sub-Committee, and reasons given for taking action without consulting them."

"(Sgd.) E. B. Skinner,
24th November, 1913."

---

7. ABSCONDERS.

The *Secretary* reads the following letters:—

"Kuala Lumpur, 10th October, 1913."

"The Hon'ble,
The Colonial Secretary,
SINGAPORE."

"Sir,

I have the honour to acknowledge the receipt of your letter 4473 of August 13th.

In reply I have the honour to draw your attention to the fact that the Government of Johore is apparently taking action in the matter, and to submit that under these conditions it would appear to this Association doubly desirable for your Government to take analogous steps."

I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary."

"Colonial Secretary's Office,
Singapore, 7th November, 1913."

"Governor 5401/1913."

"Sir,

With reference to your letter of the 10th ultimo, I am directed to inform you that the return from the Colony of labourers absconding from employment in the Federated Malay States is governed by the "Straits Settlements Fugitive Offender's Ordinance, 1904."

2. The matter has received further consideration from the Governor in Council, but His Excellency is not prepared to recommend to the Secretary of State that the order above referred to should be amended in order to remove from a Magistrate the discretion given him in trial cases."

"I have, etc.,
(Sgd.) R. J. Wilkinson,
Colonial Secretary,
Straits Settlements."

"The Secretary,
Planters' Association of Malaya,
Kuala Lumpur."

"Kuala Lumpur,
"No. 7332/13." Federated Malay States,
27th November, 1913."

"Sir,

I am directed to refer to your letter of the 22nd July, 1913, enquiring that steps be taken by the Government of this Peninsula to make "absconding" an extraditable offence.

2. Legal provision already exists under the Straits Settlements Fugitive Offenders Order of 1904—and the Federated Malay States 1904 Enactments entitled the Straits Settlements Offenders Enactment for the surrender of absconding labourers as between the Straits Settlements and Federated Malay States sub-

ject to the direction of the Magistrate in cases where the offence may appear to him to be of a trivial nature.

3. As between the Federated Malay States and the protected States of the Peninsula no legal provision exists at present for such surrender but when the general arrangements now under consideration as to the surrender of offenders in that area are made it is not anticipated that the offence of absconding from labour will be excepted from the application of the proposed legislation."

"I have, etc.,
(Sgd.) J. F. Owen,
Ag. Under Secretary, F. M. S."

"The Secretary,
The Planters' Association of Malaya,
Kuala Lumpur."

---

8. Labour Code Amendments.

The *Secretary* reports on the amendments passed at the Federal Council held in November and reads the following correspondence:—

"Kuala Lumpur, 11th October, 1913."

"Controller of Labour, F. M. S.,
Kuala Lumpur."

"Sir,

Reverting to a discussion, which took place at a meeting of this Association held on the 5th inst., I have the honour to submit the desirability of amending 66 of the Labour Code by eliminating the words "on a place of employment."

"I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary."

"Office of the Controller of Labour."

"No. 2 in 616/1913." "S. S. and F. M. S."

"Kuala Lumpur, 13th November, 1913."

"Sir,

With reference to your letter of the 11th ultimo submitting the desirability of the amending Section 66 of the Labour Code by eliminating the words "on a place of employment," I have the honour to inform you that the proposal was considered at a meeting of the Immigration Committee held on November 7th current and it was decided that sufficient grounds have not been advanced for recommending an alteration of the law.

I am not therefore prepared to move in the matter at present.

2. I am requested to say that should your Association desire the Immigration Committee to consider the matter any further

it is requested that fuller particulars may be given as to the number of estates employing Tamil labourers in numbers less than ten, and as to the actual difficulties arising out of existing conditions.

3. I have been informed since the meeting of the Immigration Committee that the Honourable Mr. E. B. Skinner (who was obliged to leave the meeting before the discussion of this item on the agenda) has embodied the proposed amendment to Section 66 in a private Bill amending the Labour Code which is to be submitted for consideration at the next meeting of the Federal Council."

"I have, etc.,
(Sgd.) E. S. Hose,
Ag. Controller of Labour, F. M. S."

Mr. Tayler considers that Section 66 decidedly wanted amending and if a strong case was to be made out, he would propose that all Constituent Associations be written to for information.

Mr. Jeavons certainly thinks that the minimum area should be reduced at least to 5 acres and seconds the proposal, which is carried.

"Office of the Controller of Labour,
S. S. and F. M. S.,
Kuala Lumpur, 15th November, 1913."

"Sir,

In continuation of my letter 2 in 618/1913 of the 21st ultimo on the subject of the suggestion that the local railway fares of Indian Immigrants should be defrayed by the Indian Immigration Committee, I have the honour to inform you that at a meeting of the Committee held on the 7th instant it was decided that the local fares by railway, steamer, or motor-bus of immigrants who have received assisted passages from India should be paid for out of the Immigration Fund with effect from the 1st January next.

2. It will probably be necessary to amend Section 161 of the Labour Code in order to enable the Committee to make disbursements from the Fund on this account.

3. It was further decided that the Committee will take over the work of landing immigrants at Port Swettenham, charging the cost to the Fund, with effect from the arrival of the first steamer leaving Madras on or after the 1st December next."

"I have, etc.,
(Sgd.) E. S. Hose,
Ag. Controller of Labour, F. M. S."

"The Secretary,
Planters' Association of Malaya,
Kuala Lumpur."

"Office of the Controller of Labour."

"No. 4 in 618/1913." "S. S. and F. M. S."

"Kuala Lumpur, 18th December, 1913."

"Sir,

With reference to my letter of even number dated the 15th ultimo on the subject of the landing, feeding and distributing of immigrants who have received free passages from India, I have the honour to inform you that Messrs. Boustead Hampshire and Company have agreed to the following reduced scale of agency charges in respect of such immigrants:—

A. Charges to be made if coolies are not distributed by the Agents, that is to say, if delivery is taken by the employer at the depot:—

Actual cost of feeding plus an agency fee of 20 cents per cooly. The agency fee to be reduced to 15 cents in any month in which more than 100 coolies are dealt with for one employer, and to 10 cents in any month in which more than 200 coolies are dealt with for one employer.

B. Charges to be made if the coolies are distributed by the agents to place of employment:—

As above, with an additional agency fee of 20 cents per cooly. This additional fee is to be reduced to 15 cents in any month in which more than 100 coolies are dealt with for one employer, and to 10 cents in any month in which more than 200 coolies are dealt with for one employer.

2. The new scale of fees, together with the arrangements for payment of local fares by the Immigration Committee, must await the passing of an amendment to the Tamil Immigration Fund Ordinance of the Straits Settlements enabling the Indian Immigration Committee to meet the proposed charges from the Fund.

3. Messrs. Boustead Hampshire and Company, while assenting to the proposed reduction of their agency fees, have pointed out to me that they suffer serious inconvenience from the delay in many cases in settling their accounts. They have quoted actual figures which show that there are reasonable grounds for complaint. I would therefore ask you to be good as to impress upon the members of your Association the importance of meeting the agents in this matter, especially in view of the very material modification in charges that have been secured.

4. Negotiations are being conducted with Messrs. Kennedy and Company of Penang with a view to obtaining similar reductions in their fees."

"I have, etc.,

(Sgd.) E. S. Hose,

Ag. Controller of Labour, F. M. S."

The Secretary also reports the opening of a Home for Decrepit Indians in Kuala Lumpur and lays official notice on table.

11. Javanese Labour.

The Secretary reads a letter received through Mr. Maude from the Labour Association, Ltd.

Mr. Maude suggests that the matter be referred to the Standing Committee and a move made. The firm in question said they could get over Javanese coolies at cheaper rates than planters in Sumatra could, probably for $40—$50 a head.

Mr. Milne seconds the proposal which is carried.

12. Newspaper Agitation.

The Secretary reports that he had approached the Chief Secretary F. M. S., as instructed, but that it had been found inadvisable to take any legal action.

Mr. Munro says that in accordance with the decision arrived at the last meeeting Mr. C. T. Ambikapat Rai had made his enquiry. He understood Mr. Rai had been very thorough in his enquiries and investigations from north to south of the Peninsula, and he believed he was right in saying that in hardly any case had he found anything whatever substantiating these statements. Of course there must be black sheep everywhere, and it was not to be expected he would find absolutely everything according as they would wish it to be, but he believed they would find he said that were there had been any question as to the want of proper handling of coolies it had mostly been amongst his own countrymen and not amongst the European employers of labour. The result of his enquiries should be very widely circulated, as a refutation, practically complete, of all those exceedingly unpleasant statements appearing in what was supposed to be a respectable publication, and he was glad to hear that it was shortly going to be published in pamphlet form and made accessible to a wide public.

13. Reduction of Wages.

The Secretary lays on table Minutes of Conference held on December 28th 1913 at Kuala Lumpur.

Mr. Cumming proposes that the Resolution passed at the Conference be adopted.

Mr. Maude seconds this motion, which is carried unanimously.

14. Licensing Rubber Dealers.

The Secretary reads the following correspondence:

"Kuala Lumpur, 17th November, 1913."

"The Under Secretary, F. M. S.,
Kuala Lumpur."

"Sir,

I have the honour to confirm my letter of June 24th on the subject of Licensing Rubber Dealers, and to enquire whether your Government is proposing to deal with this matter, as suggested."

"I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.

"Kuala Lumpur,
"No. 16 in 6237/1913." Federated Malay States."
"4th December, 1913."

"Sir,

With reference to your letters of the 25th June and of the 17th November, I am directed to inform you that the working of the Rubber Dealers' Enactment 1909 has been the subject of enquiry. Reference has been made to the Residents of all the States of the Federation but the Government has not been placed in possession of evidence to show that there is any necessity for a more stringent administration of the provision of this enactment.

2. It is on record that when the Enactment was passed in 1909 it was not the intention of the Government to appoint a special staff to administer it as it was considered that the existing staff of the land and District Offices was sufficient for the purpose.

3. Since that time there have been appointed Agricultural Inspectors in Perak, Selangor, Negri Sembilan and Pahang, who have statutory powers of inspection under the Enactment and instructions have been given to those officers to inspect the books of accounts of licensed dealers or owners and treaters of rubber.

4. It is also proposed that the names and addresses of licensed dealers shall be published in the Gazette.

5. The Government is not prepared to assent to the suggestion that a special branch of the Customs Department should be formed or that special European Inspectors should be appointed under the Enactment, nor is it considered necessary to introduce a system on the lines of the Licensing Justices of the Excise Department as suggested for dealing with applications for licences."

"I have, etc.,
(Sgd.) J. F. Owen,
Ag. Under Secretary, F. M. S."

15. Agricultural Department.

The *Secretary* reads the following correspondence:—

"Kuala Lumpur, 14th October, 1913."

"The Hon'ble,
The Colonial Secretary,
Singapore."

"Sir,

I have the honour to refer you to a letter written by the Malacca Planters' Association under date Oct. 1st 1913, to the Resident of Malacca on the importance of rendering the services of the Agricultural Department of the Federated Malay States available for the Colony.

The original resolution to this effect passed by the Malacca Planters' Association was brought forward at the last meeting of this Association held on the 5th inst., when I was instructed to inform you that this Association fully endorses the views of the Malacca Planters' Association on this subject."

"I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary."

"Malacca 5865/1913." "Colonial Secretary's Office,
Singapore, 21st October, 1913."

"Sir,

I am directed to acknowledge the receipt of your letter of 14th October current, relating to the proposal that the services of the Federated Malay States Agricultural Department, should be rendered available for the Colony, and to inform you that the matter is receiving attention."

"I have, etc.,
(Sgd.) S. W. Arthur,
for Colonial Secretary,
Straits Settlements."

"The Secretary,
The Planters' Association of Malaya,
Kuala Lumpur."

16. Marketing of Rubber.

The *Secretary* reads the following letter:—

"The Manhattan Rubber Mfg. Co., of New York."

"New York, December 12th, 1913."

"Secretary,
Planters' Association,
Kuala Lumpur, F. M. S."

"Dear Sir,

We are quite large purchasers of Plantation Rubbers from time to time and have found considerable difficulty in the fact that when we make a contract for say five (5) tons First Latex Hevea Brasiliensis Plantation Rubber that when the rubber is received by us it apparently came from half a dozen different Estates, and when we make tests of these different lots the variations are quite considerable, so much so that we are not able to use Rubbers from different estates for the same purpose, and this of course complicates matters for us in our manufacturing Department.

The purpose of this letter is to ascertain if I possibly can from you how we can purchase rubber directly from some of the Standard Estates in your part of the world and have the Rubber shipped direct to us in New York and not be subject to the possibility of having a lot of Rubber sent us which would come from several different estates, or possibly from two or three different countries. In other words, we would prefer to do business with principals direct, rather than through London Brokers.

If you can put us in communication with reliable estates who are in a position to market their rubber direct we would appreciate it very much. We of course in turn would establish such credits, or make such financial arrangements as would be entirely satisfactory to people in your part of the world.

Thanking you in advance for your kind attention to this matter,

Very truly yours,
(Sgd.)
President,
The Manhattan Rubber Mfg. Company."

Mr. Munro draws attention to the importance of this letter, which ought to be given the widest possible publicity. It was quite clear that the interests of the Rubber Industry lay in direct dealings between producer and consumer.

Mr. Maude quite agrees and would like the letter to be brought to the notice of all shareholders in England. At present the influence of a small clique of agents and brokers, with vested in-

terests in London, stood between them and the manufacturers, but the real owners *i.e.* the shareholders, were beginning to wake up to these facts. He would like copies of the letter from the Manhattan Co. to be sent to all the London Financial papers, the "Daily Mail," the Rubber Growers' Association, etc. Personally, he was convinced that the best market for Plantation Rubber from Malaya was Singapore and that it was the market of the future for this produce.

---

17. L. C. Brown, Testimonial.

The *Secretary* reports progress made in collecting subscription.

Mr. Munro says he had taken it upon himself to purchase a silver bowl, suitably inscribed, and he hoped the form of the gift chosen by him would recommend itself to members.

The bowl is placed on Table and the action of Mr. Munro agreed to.

---

18. Lower Perak.

Mr. Counsel wishes to propose a motion on the subject of the Standing Committee and says that Bagan Datoh had suffered for longer than they cared to remember, from the most tremendous drainage and other disabilities. In August last matters came to a head, and the position was a very grave one, so grave that it was apparent that, if something drastic were not done at once, at least fifteen thousand acres of the finest coconut land in the country, many under cultivation, would have been very seriously damaged, probably wiped out altogether. They were young and struggling, unknown and far out of the way, the only thing to do was to go to the fountain head, the Chief Secretary, at once, and tell him if $172,000 were not spent very quickly they could not carry on. The then Chairman of their Association very properly suggested that as they were only a part of the P. A. M. it was right and courteous that they should approach Government through the parent body. Accordingly in August they wrote asking that they be allowed to meet the Standing Committee. They were told the next meeting of the P. A. M. would be held in October and, following that, one in Teluk Anson in December. It was impossible however, to wait, even for the October meeting, so they took action themselves. The Chief Secretary came down, and they got more than they wanted, and given in the most charming and courteous way.

Now that was very nice and creditable to the Bagan Datoh D. P. A. but it was clear to him and to his friends that the right of every constituent association to the assistance of the Parent body

badly wanted re-affirming. He did not wish to enlarge on the point, but would himself propose:—

"That this meeting affirms the inherent right of any District Association in matters of special urgency to approach the Standing Committee of the P. A. M. as a deputation through their duly appointed delegates to lay such urgent matters before the Standing Committee with a view to obtaining the immediate help and influence of the P. A. M. in any way found to be advisable."

The motion, having been seconded by Mr. Davidson, is carried without discussion.

19. General.

The Secretary lays on the Table Circular re Third International Congress of Tropical Agriculture (London, 1914) and particulars of Carnauba Wax Palm.

The Meeting terminates at 12.30 p.m.

H. C. E. Zacharias,
Secretary.

RUBBER GROWERS' ASSOCIATION.

Report of Standardization Committee.

The report of the Standardization Committee, to the Council of the Rubber Growers' Association, appointed to consider a scheme for a more accurate system of standardization and valuation of Plantation rubber and for extending the use of Plantation rubber which has been received recently is a very instructive document and shews the interest which is being taken in this important subject by those directly interested in plantation Para rubber, and by manufacturers and leading rubber technologists.

The following review of the report gives a digest of the evidence submitted and a criticism of the proposals, particularly with reference to the scheme inaugurated at the Agricultural Department.

The report is divided into seven parts as follows:—

1. Report on standardization of other products, such as wool, coal and wheat.
2. Reports on estimate of cost of proposed testing station and factory.
3. Conference of manufacturers and technologists.
4. Report on the nomenclature of crude rubbers.
5. Report on the testing scheme.
6. Draft specimen of certificate.

7. Circular for distribution among Estate Managers re methods of coagulation and treatment of latex, etc.

Sections 1, 2, 4, 5, and 6 do not materially affect the general idea, and are of less importance and interest to planters in comparison with the other sections.

Standardization of other Products.

With reference to Section 1 it is generally well-known by this time that a large number of products are tested by chemical, physical or mechanical methods based on scientific experiments, and sold on the basis of certificates; the idea of selling raw rubber on a similar basis is merely an adaptation of old methods to a new industry, except in so far, as the tests to be adopted are concerned, since these have no exact counterpart in the case of other products and the methods of testing even are in a state of evolution.

Estimate of Testing Station, Etc.

The estimates prepared by Dr. Schridowitz, one of the leading consulting chemists in London who has been engaged in rubber work for some years, are of interest locally only in so far as they give an idea of the extent of the scheme. Thus the smallest scheme proposed deals with 10,000 tons of raw rubber per year and since it is proposed to sample each ½ ton or say 10 cases of rubber, this means the testing of about 20,000 samples per year or between 60 and 70 samples per day. This would mean a large number of mixing machines and vulcanising pans, and other machines such as calenders on a smaller scale. A mixing may occupy half an hour or longer, and assuming an eight hour day as suggested, this would mean a maximum of 16 samples on one machine and would probably be considerably less, so that 5 to 6 of such machines would be required,

With the present plant at the Agricultural Department, F. M. S., it would not be possible to do more than 16 samples per day and the actual number in this climate and working under local conditions would probably not exceed half this number. This part of the subject will be discussed later.

Nomenclature of Plantation Rubber.

Section 4 on nomenclature contains a letter by Mr. Cyril Baxendale and gives the results arrived at by a Committee appointed by the Executive Committee of the International Rubber Conference held in New York in 1912. This Committee suggested the adoption of various commercial terms for Eastern Plantation rubber indicating its nature, botanical source and country of origin.

Certificate of Quality.

Section 6 as its title indicates, gives a draft certificate indicating the results obtained by the various tests applied, and giving an index figure of quality for each sample, enabling any manufacturer to compare the sample with others giving similar results, once such figures had been correlated with works' practice.

Report on Tests.

Section 5 contains a report by Mr. Burgess (late Govt. Analyst S. S.) on the tests suggested by Dr. Schridowitz in which he agrees that the tests proposed are scientifically sound and likely to be of value. Other evidence to this effect is given under Section 3.

Conference of Manufacturers, Etc.

This section dealing with the evidence given by manufacturers, leading rubber technologists, etc., on the quality and variation of plantation rubber, on the value of the proposed testing scheme and the soundness of the tests suggested, is of great interest.

Manufacturers' opinions on the variation of plantation rubber, the futility of the present method of buying on "hand-pulling" tests, etc., are ample confirmation of views expressed previously in by the writer and others. This evidence may be summarised briefly as follows:—

1. Plantation rubber varies considerably in quality and the variations are greater than those found in different samples of "Fine Hard Para." This opinion was expressed generally and is based on tests as well as on works' experience. There is considerable variation especially in smoked sheet.

2. Grading of Plantation rubber needs consideration.

3. Present method of judging raw rubber by brokers, etc., of no value, as two samples, apparently the same, behave quite differently on vulcanisation.

4. Variability affects the whole market for plantation rubber, as it tends to lower the market value of even the highest grades.

5. Variability the real cause of manufacturers' dislike of plantation rubber compared with Fine Hard Para. Manufacturers would use more if they could rely on a more standard material.

6. An absolutely standard material not possible owing to variation in latex, etc., but the tests proposed would differentiate the samples.

(*N. B.* Fine Hard Para means only the highest quality of S. American smoke cured rubber previously graded.)

7. The scheme of valuation and testing proposed is considered sound and manufacturers state that after trial they would be prepared to buy on certificate.

One interesting point brought to light at this conference was the fact that large manufacturers with testing laboratories at the factory were able to buy raw rubbers considered inferior by buyers, at a cheap rate, whereas the small manufacturer would have no means of knowing the quality of the rubber purchased except by the bitter and costly experience of a spoilt batch in manufacture, so that the proposed scheme would be of great value to those factories having no testing department.

Circular for Estates.

This circular contains nothing new as far as methods of coagulation and subsequent treatment of raw rubber in the estate factory is concerned, but lays down certain methods which should be adopted by all well managed estate factories. Unfortunately in this country, this important part of the work is often very badly supervised and the coagulation, etc., is done entirely by natives, with little or no European supervision.

Remarks.

The recommendations of the Committee are to the effect that a testing station and experimental factory should be started on the lines of Dr. Schridowitz's report, such station to issue certificates of quality of the samples tested. To carry out these recommendations it is suggested that a Company be formed in which the different rubber companies should become shareholders.

There is no doubt in my opinion that the scheme proposed is excellent in principle, but is probably somewhat premature, as more experimental work is required in connection with methods of preparation of the raw material. It will undoubtedly however place a real value on plantation rubber from any particular estate and tend to raise the market value of such plantation rubber which is at present sold at a price not commensurate with its real quality. At the same time, estates whose rubber obtains a low index figure of quality will know that something is wrong with the methods of preparation, and will be able to improve these accordingly.

With the present methods of judging, it is practically impossible in many cases to remedy so-called defects, as these often exist only in the imagination of the buyer. The general opinion is that the proposed scheme will tend to raise the market value of most of the First Quality Plantation rubber and, with this opinion, I think those who have any knowledge of the subject will agree.

It may be thought that this scheme will have the effect of modifying that already adopted by the Agricultural Department, but while this may or may not be the case as far as the future development and ultimate idea of our scheme is concerned, *i.e.*, the formation of a testing station for Malaya, at which certificates of quality of all estate rubber could be issued on lines similar to those laid down in the R. G. A. report (Vide Agri. Bull. Vol. I, No. 10, p. 348) the original idea which will need no modification, was a scheme of testing for research purposes, in order to test plantation rubbers from trees of different ages, under different tapping conditions, etc., and prepared by different methods of coagulation machining and curing or drying with a view to evolving a method of preparing a raw rubber equal to or better than Fine Hard Para. This scheme was inaugurated on account of the fact that there are no satisfactory methods of testing raw rubber, and because market values gave no idea as to the real quality of any sample; after about six months preliminary work on coagulation methods, etc., it was realized that tests carried out on vulcanised rubber were the only real criterion of quality.

There is a vast amount of work to be done in this direction alone, quite distinct from the larger scheme of a testing station. Apart from the commercial value of such work, the scientific worker is not satisfied until the underlying causes producing the results obtained, are ascertained, that is to say in this case, we want to ascertain the actual cause of differences in quality, and to trace it to any one or more factors.

In the R. G. A. scheme it is suggested that a testing station would be preferable in England to one in the country in which the rubber is produced, owing to changes which may occur in the rubber during transit. I do not think this statement has much foundation in fact, as far as deterioration is concerned. Any obvious damage caused by sea water, etc., would easily be discovered and the question of temperature in the hold of a ship—away from boilers or other artificial source of heat, is probably negligible in the case of rubber from the tropics. This is a point however that could easily be tested. In the event of Singapore becoming the centre of a large rubber auction, as appears probable, a testing station in Malaya would be of great importance, apart from any such station in England, and the present plant at the Agricultural Department would form an excellent nucleus for this purpose.

With regard to the nature of the proposed tests, very little information is disclosed. The criticism by Dr. Stevens is of interest as he shows the time occupied in carrying out the work and indicates the necessity of allowing the vulcanised rubber to rest before the tests for tensile strengths, etc., are applied. His re-

marks with reference to the behaviour of the rubber in the mixing rolls are also of interest. It is generally understood however that the more difficult a sample of rubber is to "break down" in the mixing rollers, the higher its quality.

B. J. E.

LOCUST WORK IN DECEMBER.

By F. de la Mare Norris.

Contrary to expectations, locust work in Selangor during the month of December continued to be of a purely non-destructive nature; it was anticipated that the breeding season would be in full swing, but for some reason, possibly depending on the amount of rain which fell during the month, no breeding has taken place. Swarms continue to decrease in number, though some have increased in size, pointing to the fact that they are joining forces.

The conductors have as before been stationed in the various districts throughout the State, and have kept the flying swarms under observation. One swarm flew off in a northerly direction and reached Kerling. It was however small and has practically ceased to exist, an inspection of the district early this month revealing only a few solitary locusts.

As anticipated, the large swarms from Rasa, which moved in an easterly direction far into the Bukit Kutu Forest Reserve in October, reached Pahang, and a report of fliers came from Bentong. A conductor was sent to investigate, and three contingents of the swarm were located. The swarm had suffered considerably during its journey and was in a very poor condition. Further inspection has shown that it has been dying out rapidly, and it is doubtful if it will ever give rise to another generation. Precautions have been taken to keep the remnant under observation, but it is thought that there is very little to fear from this direction.

In Negri Sembilan the destruction work went steadily forward, and towards the end of the month the Seremban, Tampin and Kuala Pilah districts were practically free from hoppers.

The catch throughout the State for the month was approximately 1500 tins, representing about 400 swarms. During the month experiments with various poisons were carried out in this State by the Government Entomologist, and some very favourable results were obtained. It is hoped in dealing with the next generation of hoppers partially to supplant the bag-trap system by the use of poisons.

NOTES ON INDIGO PLANTING IN MALAYA.

By F. G. Spring.

A considerable amount of interest was evinced on this subject after an address to a gathering of planters and others at the Department of Agriculture, Kuala Lumpur, in July 1912. It was evident at this meeting that those present were rightly sceptical as to the growing of this product until it had been tried experimentally in Malaya and in consequence of which it was decided to cultivate a few of the better varieties of Indigo at Kuala Lumpur Experimental Plantation.

Indigofera arrecta, which is considered one of the best varieties, was grown as a subsidiary crop to young coconuts and rubber, the former area covering roughly four acres and the latter about two. The land on which the tests were made was undulating, of a laterite nature, in good condition as regards tilth and entirely free from lalang and other noxious weeds at the commencement.

The ground was forked to a depth of about 6 inches and the surface soil reduced to a state of five division previous to sowing. The seed was then broadcast as recommended in four directions, at the rate of 42 lbs. to the acre. The writer's experience is that this quality is excessive, 10 lbs. being ample if good quality seed is obtained. Too heavy sowing is expensive and unnecessary when it is remembered that the ultimate distance of the plants is about 3 feet apart each way, there is also a danger of the seedlings being overcrowded which would retard growth.

When possible drill sowing would appear to be preferable to broadcasting.

The growth and health of the Indigo at the commencement was quite good and the first crop of seed was fairly satisfactory. After the collection of seed the plants were cut to a height of about 8 inches from the ground and the stumps threw out new shoots and attained a height of from 3 to 4 feet in about 2½ months. It was at this stage that the plant proved itself most susceptible to the ravages of the caterpillars of a moth. The plants were entirely stripped of their leaves and as soon as new shoots appeared they were readily devoured, the ultimate result, in almost every case, was the entire destruction of the plant.

Indigofera sumatrana, was grown on a smaller scale but with similar results.

Indigofera Aril was sown in nursery beds, the percentage germination of seed was good, and the seedlings grew well until they attained a height of about 4 inches when it appeared to be attacked in a similar way.

Indigofera hirsuta which was also grown on a small scale, did remarkably well until the period of seeding when it was also noted to be attacked by this insect. To test whether this caterpillar was a pest to other plants in general or confined itself principally to Indigo the varieties *arrecta* and *sumatrana,* were grown in nursery beds surrounded by a varied selection of plants including many of the Leguminosæ, the same order of plants as Indigo. Without an exception all the Indigo plants were attacked but in no case could any damage be found done to the surrounding foliage.

At Castleton Estate, Teluk Anson, better results were obtained. The soil here is of an alluvial nature of a heavy type. The mode of cultivation, there was changkolling and harrowing, the seed being afterwards drill sown.

The *I. sumatrana* gave good percentage germination of seed and the growth as regards branch and leaf development was all that could be desired.

In the case of *I. arrecta* the germination of seed was good but the growth of the young plants was irregular. Both varieties were entirely free from insect attacks. Two cuttings could easily be obtained in a year and under good conditions probably three.

Indigofera Aril and *hirsuta* were both grown on a small scale at Teluk Anson, but did not prove satisfactory, they were however quite free from insect attacks.

It is probable that the ravages of this pest would be most serious in those lands which have been under Indigo for several years in succession. Considering that this product has not been grown in the Kuala Lumpur district before and bearing in mind the destruction done to the first crop, I am afraid that its successful cultivation in this locality appears none too hopeful. It is also probable that if the cultivated area extends the more prevalent will the pest become. I have no doubt that good crops may be grown but there is always the possibility of it turning out a failure depending to a large extent on the presence or absence of the insect attack referred to.

So far the results as a whole have not proved satisfactory and at present it is not deemed advisable to recommend its cultivation in Malaya.

Further trials are to be made and will be reported on later and if it should prove more successful than this, the first trial, the weights of green cutting per acre and its value as a green manure will then be given.

DEPARTMENT NOTES.

Mr. F. T. Brooks, Mycologist, Department of Agriculture, F. M. S. arrived at Kuala Lumpur and assumed his duties on 3rd January, 1914 (Vide A. B. Vol. II, No. 5, p. 140).

Mr. H. H. Stirrup, Assistant Agricultural Inspector, Department of Agriculture, F. M. S., arrived at Kuala Lumpur and assumed his duties on 17th January 1914 (Vide A. B. Vol. II, No. 5, p. 140).

Mr. J. R. Hill, Chemist, Institute for Medical Research, F. M. S. has been transferred, to the Department of Agriculture, F. M. S. as Assistant Agricultural Chemist.

ULU SELANGOR DISTRICT PLANTER'S ASSOCIATION.

A general meeting of the above association was held in the Rest House at Kuala Kubu at 9.30 on December 14th. The following were present:—

Messrs. W. de L. Brooke (chairman), E. Granville Smith (Hon. Sec.), F. W. Davis, A. P. Mackilligin, M. J. Kennaway, F. M. Campbell, L. W. Weddige, F. G. Herose, R. M. Newton and W. A. Henderson.

1. The minutes of the previous meeting were read and confirmed.

2. The Chairman expressed his regret at the resignation of Mr. Granville Smith as Hon. Secretary and referred to the hard work he had done for the association and his estate. He proposed a hearty vote of thanks to Mr. Smith coupled with an expression of their best wishes for his future. Seconded by Mr. Henderson and carried unanimously. Mr. Smith suitably replied.

3. On the proposition of Mr. Newton seconded by Mr. Kennaway, Mr. Henderson was elected Hon. Secretary. The Chairman was appointed a delegate to the P. A. M. conference on cooly wages in place of Mr. Smith.

4. The Chairman said that they could congratulate themselves on the favourable reply from Government on the matter of telephones. Their thanks were due to Mr. Granville Smith for the extra work it had entailed, and to the Hon. Mr. E. B. Skinner for the help he gave in the matter.

5. The secretary read several letters which had been received on the matter of reduction of cooly wages. The Chairman said that before they came to their decision to reduce wages they all knew that the P. A. M. conference was coming off; but after carefully considering the matter they felt they could stand the reduction fixed on. After further discussion it was resolved to hold a meeting immediately after the P. A. M. conference.

Mr. Mackilligin proposed and Mr. Campbell seconded that "Managers should come to D. P. A. meetings with authority to act in the matter of cooly wages."

Mr. Smith proposed as an amendment that the words "in the matter of cooly wages" should be changed to "in all matters" but this was not seconded.

Mr. Mackilligin's proposition was carried.

The subject of cooly recruiting rates was postponed till next meeting.

The proceedings terminated with a vote of thanks to the Chair.

PAPAIN, ITS PRODUCTION AND USES.

The following article, abstracted from the *Indian Trade Journal,* has been sent by Mr. W. P. Hume, Commissioner of Trade and Customs, F. M. S.

Apart from the variation and adulteration of this drug referred to in the abstract, it would appear that much of the so-called papain on the market consists of pepsin, another enzyme or unorganized ferment, having a digestive action on proteid matter.

The question of the cultivation of the papaya tree for extraction of papain will probably be considered later on, as it may be, at any rate, a useful product to cultivate on a small scale.

Mr. Charles K. Moser, the United States Consul at Colombo, has been at some pains to collect reliable information about the production and uses of papain—the most important chemical constituent of the papaya fruit—and in a note recently published by the Department of Commerce at Washington he gives a number of interesting facts. The *Carica papaya* is very commonly cultivated in gardens throughout India and in localities more or less naturalised. It grows largely also in Ceylon, the East and West Indies, and the Hawaiian Islands. The tree attains a height of 20 to 30 feet, and its fruit resembles a small muskmelon in size, shape, and appearance. The fruit is green when unripe, greenish yellow when ripe, with rich yellow flesh, and contains in its hollow interior hundreds of small, round black seeds with a flavour somewhat like nasturtium seeds. From the fresh milky juice that exudes from both the fruit and the tree itself papain is obtained.

There are several varieties of *Carica papaya,* and the papain derived from the different kinds varies accordingly, the best being obtained from the male trees of the Ceylon hybrid papaya. The papain obtained from the West Indian variety is said to be inferior.

The digestive and disintegrating properties of papain are remarkable. The milk and even the fresh leaves of the papaya tree are said to render the toughest beef tender in the space of

two hours. Mr. Moser states that native cooks invariably wrap tough raw beef with the fresh leaves for half an hour, or apply a small quantity of the fresh milk directly to its surface, or put a piece of the green fruit into a raw curry when the beef will not boil soft. If a large quantity of the juice is applied to the raw beef it reduces it in little over half an hour to a pulpy mass that appears as if it had undergone partial digestion. Papain is said to be capable of digesting ten to twelve times its weight of egg albumen at the temperautre of the human body.

There are many other uses for papain. Taken as a tabloid or in the form of raw fruit, it acts gently but effectively upon the liver and bowels. It is also said to remove freckles and is frequently used by the natives of Ceylon as a soap. From its power to remove stains in clothes, papain is called "melon bleach" by the Singhalese, and they use it in the water when washing coloured clothes, especially black, which it seems to intensify. In the Antilles it is used as a cosmetic and produces clear, satiny complexions.

Commercial papain, or the crude drug, is a brownish, gummy substance looking like coarse bran or irregular granules of gum arabic. In Ceylon it is prepared by treating the juice of the fruit with rectified spirits and either drying in the sun or evaporating in dry-air chambers. The age, sex, and variety of the tree are important in determining the quality of the dried preparation. Papain is insoluble in water, coagulates when heated to 175° F. or when exposed long to air, and has an acrid taste and acid reaction.

According to a Ceylon authority (Dr. H. Huybertsz), commercial papain is prepared in granules and powdered forms. The natural colour of the former is a light brown, which becomes darker when exposed to the air for any length of time. Powdered papain is of a light biscuit colour, which does not change on exposure to air; a darker-coloured powdered papain indicates adulteration or improper preparation. Dr. Huybertsz states that European and American importers object to papain in its natural colour and insist that it be white or at least light. This, he says, is a great mistake, as it can only be obtained by bleaching, a process which sacrifices therapeutic efficacy for pharmaceutical appearance.

The taste of papain is slightly saltish and somewhat acrid. It has a peculiar, unmistakable smell, and the "feel" of granular papain should be crisp like biscuit and easily crushed between the fingers. When it is doughy or sticky it has been adulterated or badly prepared. It also has slight caustic action, and collectors of the fresh juice have the skin of their finger tips blistered. When

mixed with water it has a soapy feel. Its adulterations are many and often difficult to detect, and range from dough and bread crumbs coated with the fresh juice and dried, to the addition of gutta-percha and wild cactus milk. Dr. Huybertsz quotes as follows from a medical journal:—

At present a crude material prepared by natives, and containing abundant adulteration, is purchased cheaply by local firms, who export it as papain or papaya juice. Its preparation is primitive, and consists only of drying in the sun or over a smoky fire, and of thickening by the addition of starchy matter, such as rice, congee, bread, flour, arrowroot, biscuits, etc. Recently the native has resorted to the use of a dangerous adulterative material, *viz.*, the milk from the gutta-percha and wild cactus. The latter has irritant properties, acting as a caustic. The comparative failure of papain as a therapeutic agent is undoubtedly explained in part by the sophistication to which it has been subjected.

Up to a comparatively few years ago the value of papain was little understood and it was mostly used in making mucilaginous products. Since then the United States, Germany, and England have imported considerable quantities. However, the exports of papain from Ceylon to the United States amounted to only about Rs. 4,000 in 1911 and Rs. 13,000 in 1912. Mr. Moser is of the opinion that the smallness of the export trade is due to the fact that American importers prefer the inferior qualities from the West Indies; also they desire a white or bleached papain, which the Ceylon native is not always in a position to supply. American importers could, he thinks, procure, without much difficulty, an almost unlimited supply of the best unadulterated Ceylon papain if they were willing to pay a slightly better price for it than for the West Indies product and would accept it in its natural state. The price of crude papain in the London market some fifteen years ago was approximately 18*s.* 9*d.* per pound; now the price for medium first quality is said to be about 8*s.* in London and 8*s.* 9*d.* ($2.10) in New York.

The writer of the report makes no mention of the fact that the juice of the unripe papaya fruit is efficacious in the treatment of certain skin diseases. **B. J. E.**

NOTE ON THE RAT AS A COCONUT PEST.

By H. C. Pratt.

The position of priority as a really serious pest to young coconuts in the Malay States must be given to rats. They have caused immense damage in several districts, completely destroying as much as 2000 acres in one locality. They are not constant in their attack. At certain times of the year they invade young fields

in immense numbers and working at night nibble the base of the trees, eventually eating out the heart, leaving a hole about 2½ inches in diameter. The young plant naturally dies. Several remedies were tried and that which is the most satisfactory is the protection of each individual tree. Originally the expense of this method was its one drawback. With kerosene tins it would cost $17 per acre. With sheets of zinc the cost was reduced to about $12 per acre. Several designs were tried in order to reduce the cost and it is now possible to prevent the ravages of this destructive animal at a total cost of $5 per acre. Considering the immense damage which rats cause this may be regarded as a nominal cost, although it may be possible still further to reduce it. All estates having young coconuts, *i.e.,* those recently planted out, and where rats have previously demonstrated their ability to devastate large tracts of land should as a matter of insurance be prepared to spend this amount on protecting their recently planted areas. It is quite apparent that non protected areas in some districts are very liable to be destroyed and should this happen the loss involved includes the following:—

1 year lost.
1 year's weeding.
Re-lining.
Re-planting.
Purchase of nuts.

The following method for the protection of young trees will prove satisfactory. Out of a piece of zinc 18″ long and 12″ wide an arch is cut at the middle of the longer edge, measuring approximately 7″ wide at the base, and 5″ high.

The nut itself fits into this arch and by drawing the tin round the tree a cylinder about 5 inches in diameter is formed enclosing the young tree which practically fills the cylinder. The base of the cylinder on either side of the arch is buried about 3″ in the ground thus enabling the top of the arch to fit tightly over the upper part of the nut. No rat can harm a young plant protected in this way, for if access is obtained by burrowing there is no room for the rat to work within the enclosure.

Older trees can be dealt with more easily and by the cheaper system of attaching a ring of tin to the trunk with the upper edge turned down. It would not be feasible, on account of expense to enclose older trees. Although it is probable that where the rats are in excessive numbers no trees would be really immune there can be no doubt that it is the younger ones, in fact those recently planted, that require guards. After they are a year old they are not at present often damaged and the guards above described will protect them for this necessary period.

FEDERATED MALAY STATES.

Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected Thereon, during the Years 1913 and 1912.

Destination.	Exported during Dec. 1913.	Previously.	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1913.	Duty collected, 1913, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	$	$ c.
Straits Settlements ...	1,226.54	9,714.69	10,941.23	6,595.68	4,345.55	...	25,877,767	642,182.71
United Kingdom ...	1,138.32	9,367.42	10,505.74	7,466.80	3,038.94	...	25,808,869	645,221.72
Continent of Europe ...	180.65	1,220.37	1,401.02	1,029.73	371.29	...	3,442,696	86,067.40
Ceylon	70.30	547.55	617.85	402.88	214.97	...	1,534,627	38,365.67
Other Countries ...	...	...	...	10.45	...	10.45	...	...
Total ...	2,615.81	20,850.03	23,465.84	15,505.54	7,970.75	10.45	56,663,959	1,411,837.50*

* Figures obtained by wire and subject to rectification.

KUALA LUMPUR,
7th January, 1914.

H. W. FIRMSTONE,
Acting Commissioner, Trade and Customs, F.M.S.

Abstract of Meteorological Readings in the various Districts of Malaya for the Month of December, 1913.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	143.	79.4	85.74	73.32	12.42	74.5	.761	71.1	.75%	...	23.45	3.17
Malacca, Durian Daun Hos.	29.900	149.6	81.3	86.	71.6	14 4	78.5	.930	...	.87	N.	2.74	.64
N. Sembilan, Dist. Hospital Seremban	...	148.5	78.2	88.9	71.5	17.4	75.3	.821	73.3	.85	N. W.	15.97	3.33
,, Dist. Hos. K. Pilah	...	154.7	79.5	86.1	73.5	12.6	77.6	.909	76.3	.89	...	8.01	1.20
,, ,, Tampin	...	138.3	80.1	...	...	...	75.8	.816	73.0	.79	...	7.07	1.01
,, ,, P. Dickson	...	156.1	80.8	86.9	73.4	13.5	76.9	.853	74.2	.80	...	10.06	1.98
Pahang, ,, K. Lipis	...	...	78.9	87.3	70.5	16.8	74.8	...	...	...	...	11.79	1.40
Penang, ,, Penang	29.849	138.3	81.1	87.5	73.1	14.4	76.6	.812	73.2	79.6	...	4.62	1.00
Perak, ,, Taiping	...	104.	80.34	93.	68.	25.	76.39	.857	...	.85	...	23.01	4.34
,, ,, Ipoh	...	...	81.10	92.	70.	22.	76.50	.852	...	.80	...	13.91	3.42
,, ,, T. Anson	...	...	81.39	90.	70.	20.	77.70	.902	...	.85	...	10.28	2.00
,, ,, P. Buntar	...	...	80.75	89.	71.	18.	76.60	.862	...	.82	...	7.68	2.60
,, The Cottage	...	...	...	...	...	...	...	...	...	...	...	16.58	2.63
Selangor, General Hospital Kuala Lumpur	...	120.4	80.4	88.4	77.5	10 9	77.1	.865	74.8	.83		11.43	2.85
,, Dist. Hos. Klang	...	...	79.2	86.	72.	14.	76.	...	...	...	...	10.69	2.55
,, ,, K. Selangor	...	...	...	88.4	75.4	13.	...	...	...	...	...	11.04	2.16
,, ,, Rawang	...	...	...	90.7	71.7	19.	...	...	...	...	...	12.07	2.09
Singapore, Kandang Kerbau Observatory	29.928	167.	80.7	91.5	71.8	19.7	77.	.842	...	.84	N. E.	11.73	4.29